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(54) SOCK

(71) I, JAMES THWAITES, a British subject of 4 Grange Avenue, Stockton-on-Tees, do hereby declare the invention, for which I pray that a patent may be granted to me, and the method by which it is to be performed, to be particularly described in and by the following statement:-

This invention relates to socks, and is particularly, although not exclusively, concerned with football or other athletic socks.

It is known that players of football, rugby, hockey, and the like, almost invariably wear shin-guards. A conventional shin-guard comprises a pad intended to be inserted simply inside a knee-length sock and to be held in place against the leg by the sock. It is of course important that the shin-guard is maintained in place during a game. However, in practice, it is usually the case that, during a game, the shin-guard tends to slip from its intended position within the sock, and the sock itself may fall down with the result that the shin-guard becomes ineffective, or even lost altogether.

Footballers and the like usually attempt to overcome this problem by attaching a shin-guard to the leg directly by means of bandages and/or sticky tapes. This in itself has disadvantages from the point of view of discomfort, in that circulation to the leg can be impaired, and in that hairs on the leg are usually removed with the pad. Also there is still a chance that the shin-guard may slip or the bandages and/or tapes work loose. An attempted improvement to overcome the discomfort problem consists in bandaging or taping a shin-guard onto the outside of a first sock, and then wearing a second sock over the first sock and shin-guard. However, apart from the long time involved in putting on the socks and the expense and possible discomfort involved in using two pairs of socks in place of one, this method is still often found insufficiently reliable.

As a further attempted improvement in

keeping a shin-guard in place, present-day shin-guards are often formed with outwardly facing spikes, or 'VELCRO' (Registered Trade Mark) tape or the like, to grip a surrounding sock. However, this has the disadvantage that the socks (usually of nylon) become quickly snagged and worn out, involving greater expense.

There is thus a requirement for a simple and effective means for retaining a shin-guard in position on the leg during a game, and I have found that several embodiments of the invention have met this requirement in a surprisingly effective manner.

According to one aspect of the present invention, there is provided a sock provided with a pocket which in use is located below the knee.

Although the pocket may be used for any convenient purpose, I am particularly concerned with knee-length football socks where in the pocket is for receiving a shin-guard. In trials of some such embodiments of the invention, I have found that the pocket provides a surprisingly simple and effective means for retaining a shin-guard in position during a game. Provided that the sock itself stays in position on the leg, and there is little difficulty in achieving this with present-day socks, the shin-guard can be effectively retained in its proper position during the game.

In other aspects, the invention provides an athletic sock provided with a built-in shin-guard holder, and an athletic-sock having a double-walled portion for receiving a shin-guard.

For a better understanding of the invention and to show how the same may be carried into effect, reference will now be made, by way of example, to the accompanying diagrammatic drawings, in which:-

FIGURE 1 is a front view of a first embodiment of the invention; and

FIGURES 2 to 6 are respective side views

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of second to sixth embodiments of the invention.

In the figures, like reference numerals denote like or corresponding parts.

5 In Figure 1, a knee-length football sock 1 is provided at the front of the leg with a built-in shin-guard holder in the form of a pocket 2 for receiving a shin-guard. The pocket 2 is shaped to receive a shin-guard of the type popular at the present day, but may of course be of any suitable shape to receive any other shape shin-guard (e.g. generally triangular). An opening 3 for inserting the shin-guard is provided adjacent the top of the pocket 2, and is provided with a sliding clasp fastener 4 for the closing thereof.

10 Preferably, both the sock 1 and the pocket 2 are manufactured of the relatively heavy nylon which is widely used at the present time for athletic socks, although any other suitable material may be used. The sock 1 and pocket 2 may be knitted or otherwise manufactured integrally, in a single operation. Alternatively, the pocket 2 may be stitched on, or otherwise secured to the sock 1, which has been manufactured independently of the pocket 2.

The embodiment of Figure 2 is generally similar to that of Figure 1, except that, for closing an opening 3 adjacent the top of a pocket 2 on a sock 1, a flap 5 is provided, to be tucked down inside the pocket 2 to effect closing thereof.

30 In Figure 3, an opening 3 adjacent the top of the pocket 2 on a sock 1 is arranged to be closed by means of a flap 6, which is secured to the outside of the pocket 2 by any suitable means, such as a press-stud, a button and button-hole, or interengaging hooks and eyes. The hooks and eyes may conveniently be provided in the form of 'VELCRO' (Registered Trade Mark) tape (as shown), or the like, which is in wide use at the present time.

45 In Figure 4, a pocket 2 is disposed on the inside of a sock 1, and is provided at the top of the pocket with an opening 3 which is defined by an elasticated edge of the pocket. By providing the pocket 2 on the inside of the sock 1, a more aesthetically pleasing appearance is obtained, than with the arrangements illustrated in Figures 1 to 3. For similar reasons, the opening 3 at the top of the pocket 2 is provided at a position which is below the top of the turned-over welt 7 of the sock 1, in use. I have found that the most satisfactory way of manufacturing the sock of Figure 4 is simply to stitch on a portion of pocket material on the inside of a ready formed sock 1, in order to provide the pocket 2.

65 Particularly because the pocket 2 is on the inside of the sock 1, I have found it preferable to employ a pocket material of polyester fibre. This tends to be cooler to wear

than nylon, and less liable to fray. The polyester material can be lighter in weight than nylon (and, in particular, significantly lighter in weight than the nylon of the sock 1), such that less bulky seams are provided where the pocket 2 is attached to the sock 1. Advantageously, the pocket material can be of a simple rectangular shape and can be stitched into the sock by a welting machine or a cup-stitch machine. Using such stitching methods, seaming of the pocket 2 can be quite unobtrusive on the outside of the sock.

Advantages of the sock 1 of Figure 4 are as follows. The actual shin-guard can be inserted into the pocket 2 with the sock 1 either on or off the leg. Because the pocket 2 (and sock 1) can be made of a stretch material, it is possible for the pocket 2 to accommodate most pads readily available for football, rugby, hockey and the like. In the event of a shin-guard (which usually incorporates brittle material) shattering, there is less risk of consequent lacerations to the leg, because the pocket 2 retains the broken pieces of the shin-guard much more effectively than if the guard was in direct contact with the leg. There is less risk of restricting blood flow in the leg, than is present when bandages or tapes are used, and there is therefore less risk of cramp during a game. A shin-guard can be fitted considerably more quickly than by known methods, and there is of course no tendency to remove hairs from the leg when removing a shin-guard after use. Due to the effectiveness of the pocket 2, it is unnecessary to employ a shin-guard having outwardly facing spikes or the like, so that there is less risk of snagging the sock 1, which may therefore last longer.

For even better moisture absorption for the material of the pocket 2, cotton material may be used, either alone or in a polyester/cotton mix. However, of course, cotton tends to be relatively more expensive.

Figure 5 shows a more elaborate sock 1, which provides calf, ankle and instep protection. Stitched to the otherwise conventionally manufactured sock 1 is a double-walled portion of polyester (or other) material, denoted by dotted lines 13. The material 13 provides an internal pocket 2 with an elasticated opening 3, in a generally similar manner to the embodiment of Figure 4. However, the sock 1 of Figure 1 additionally includes, within the double-walled portion of material 13, an insert 10 of protective material, such as, for example, plastics foam, the insert being shown in dashed lines. As may be seen in Figure 5, the insert 10 has two upper portions for providing calf protection, two lower portions 11 for providing ankle protection, and a central lower portion 12 for providing instep protection. The insert 10 is permanently stitched into the material

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13, and is therefore a permanent feature of the sock 1. The pocket 2 then provides means for receiving any desired shin-guard, to complete the leg protection.

5 The sock 1 of Figure 5 may be manufactured generally as follows. Firstly, the insert 10 is positioned between two layers of material 13, and then stitched in place. The material 13 can then be stitched directly into the already manufactured sock 1. If desired, the material 13 may be seamed vertically to form an intermediate legging, prior to be stitched into the sock 1. Although it will be readily apparent that certain portions of the material 13 are theoretically redundant and may be dispensed with, it appears at the present time that it may be practically most advantageous simply to employ a double-walled portion of the material 13 all the way around the side of the sock 1, as outlined above.

A particularly suitable material for the insert 10 is foamed cross-linked polyethylene of low density, such as, for example, that marketed by Messrs Bakelite Xylonite Limited, under the Trade Name "Plastazote". Such foam is washable, flexible and strong. The thickness of such a foam insert could possibly be in the range 2 to 12 mm, for example 6 mm.

In Figure 6, a sock 1 is shown fitted with a novel shin-guard 20. The shin-guard 20 is inserted into a pocket specially shaped and provided therefore in the sock 1. The pocket is preferably provided on the inside of the sock 1, generally as shown in Figure 4, but details of this have been omitted from Figure 6 in order to show the shin-guard 20 more clearly.

40 The shin-guard 20 comprises a layer 21 of foamed plastics material, such as the "Plastazote" described above. The foam layer 21 extends not only over the shin portion of the leg but also around the sides of the leg to provide calf protection. The layer 21 also extends downwardly to provide portions 22 for providing ankle protection, and a portion 23 for providing instep protection. The shin-guard 20 is therefore much larger than a conventional shin-guard, insofar as it extends substantially around three sides of the leg (rather than just over the front, shin portion), and also downwardly as far as the ankle and instep regions. A plurality of strips 24 of substantially rigid material extend at least over the shin-protecting portion of the guard 20. The strips 24 polypropylene, such as is commonly used in conventional shin-guards, and have the effect of spreading the area over which an impact is absorbed by the foam layer 21. The strips 24 are separated by spaces 25, to permit bending of the guard 20 to the requisite curvature by a hinging effect of the foam layer 21

in the spaces 25. Particularly where a relatively thick layer of foam 21 is to be employed, this hinging effect can be improved by foaming the layer 21 with grooves which extend along the spaces 25 between the strips 24. Such grooves are advantageously formed by heat pressing the layer 21 prior to affixing the strips 24 thereto.

The strips 24 may readily be secured to the foam layer 21 by any suitable adhesive. Alternatively, it may be conceivable to apply the strips 24 to the foam layer 21 whilst the strips 24 are in the process of cooling following a moulding operation, when the strips 24 will then attach themselves to the layer 21 by a heat welding effect.

After the strips 24 have been fixed to the layer 21, perforations may advantageously be formed through the strips 24 and the underlying portions of foam layer 21. Such perforations are of relatively small diameter and relatively large number, so as not to significantly affect the strength of the strips 24, and they allow air to reach the leg beneath the guard 20. As the plastics materials (such as foamed polyurethane and expanded polyethylene) used in conventional shin-guards are generally moisture impermeable, problems exist with perspiration and breathing of the legs when wearing a conventional shin-guard. The shin-guard 20 may therefore be improved in this respect. If desired, the entire foam layer 21 may be pre-formed with a multitude of small perforations, to be further improved in this respect.

The shin-guard 20 may extend around each side of a leg for a distance greater than about 50 mm than does a conventional shin-guard. The additional calf protection thus provided may comprise, for the most part, only the foam layer 21, or be reinforced partly or wholly with strips such as strips 24.

As a variant of the arrangement shown in Figure 6, the lower protective portions 22 and 23 of the guard 20 may be omitted. Optionally, then, a foam or the like insert may be sewn into the sock 1 around the ankle and instep, for example, similarly to the lower part of the insert 10 in Figure 5. Instead of providing a single shin-and-calf guard such as 20, a guard may be provided in three portions, each fitting into a respective pocket at the front and at the sides of the sock.

As an alternative to the arrangement of Figure 4, the pockets 2 shown therein may extend right up to the top of the sock 1. The pocket 2 is then closed in a positive manner merely by turning over the top welt 7 of the sock, in a conventional manner. Then, the opening 3 of the pocket 2 need not be elasticated. However, the top welt 7 of the sock

may be elasticated, to assist in holding the sock 1 up, this applying to any of the illustrated embodiments.

As an alternative to the illustrated embodiments, a sock such as the socks 1 may be provided with a pocket which is generally similar to the pockets 2, but which is not provided with an opening, such that it contains therein a shin-guard, effectively integral with the sock. Thus, the "pocket" serves as a double-walled portion of the sock for containing the shin guard, i.e. as a built-in shin-guard holder.

As a further alternative, a pocket for a shin-guard may be provided in the form of a pouch, which is preferably detachably securable to a sock by any suitable means, for example, a lace threaded through holes in the pouch and the sock. That is, the pouch is capable of completely enclosing the shin-guard even when not fitted to the sock, and the pouch need not necessarily be provided with an opening for removing the shin-guard.

I have found socks as illustrated to be particularly effective in retaining a shin-guard in position whilst playing football. In fact, I find it most surprising that, prior to my proposal, there appears to be no satisfactory way of supporting shin-guards in position during an athletic game. My "football" socks are, of course, equally suitable for use in other games, such as rugby and hockey.

Although the socks which I have described above with reference to the drawings are specifically for use with shin-guards, I envisage that a sock generally with a pocket provided below the knee may have numerous other applications. For example, a sock for use by climbers may be provided with any desired number of pockets at any suitable positions around the leg, the pockets being for holding small items of climber's equipment.

As regards the expression in this specification "inside of a sock", it is of course the case that virtually any sock can be worn inside out. However, virtually all football and other athletic socks of which I am aware have a well defined outside, which is finished off in a superior manner than is the inside of the sock, which is almost always identifiable by seams therein. Thus, in practice, there should be little difficulty in identifying which is the inside and outside of a sock, and I use the term "inside of a sock" herein in its usual sense, which will include both sides of a genuinely reversible sock.

WHAT I CLAIM IS:

1. A sock provided with a pocket which in use is located below the knee.
2. A knee-length sock according to claim 1, wherein the pocket is located at a position which is or may be at the front of the leg in

normal wearing of the sock.

3. A sock according to claim 1 or 2, wherein the pocket has an opening which is provided with a zip for the closing thereof.

4. A sock according to claim 1 or 2, wherein the pocket has an opening which is provided with a flap for the closing thereof.

5. A sock according to claim 4, wherein the sock is provided with a press-stud for the securing of the flap in a closed position.

6. A sock according to claim 4, wherein the sock is provided with a button and button-hole for the securing of the flap in a closed position.

7. A sock according to claim 4, wherein the sock is provided with interengaging hooks and eyes for the securing of the flap in a closed position.

8. A sock according to claim 7, wherein the hooks and eyes are provided in the form of an interengaging hook and eye tape.

9. A sock according to claim 1 or 2, wherein the pocket is provided with an opening defined by at least one elasticated edge of the pocket.

10. A sock according to any preceding claim, wherein an opening for the pocket is at or adjacent the top thereof.

11. A sock according to any preceding claim, wherein the pocket is knitted or otherwise manufactured integrally with the sock.

12. A sock according to any one of claims 1 to 10, wherein the pocket has been stitched or otherwise secured to the sock, which has been manufactured independently of the pocket.

13. A sock according to any preceding claim, wherein the pocket is on the inside of the sock.

14. A sock according to any preceding claim wherein the sock is of nylon.

15. A sock according to any preceding claim, wherein the pocket is of nylon.

16. A sock according to claim 12 or to claim 13 or 14 as appendant thereto, wherein the pocket is formed from a piece of material stitched to the sock, which material at least includes a polyester fibre.

17. A sock according to any preceding claim, wherein the pocket is closed at the bottom thereon.

18. A sock according to claim 2 or to any one of claims 3 to 17 as appendant thereto, wherein the pocket is for receiving a shin-guard.

19. An athletic sock provided with a built-in shin-guard holder.

20. A sock according to claim 19, wherein the holder is in the form of a pouch which has been secured or is securable to the sock.

21. A sock according to claim 20, wherein the pouch is detachable from the sock.

22. A sock according to claim 11, wherein the pouch is securable to the sock by means

of a lace threaded through holes in the pouch and the sock.

23. An athletic sock having a double-walled portion for receiving a shin-guard.

5 24. A sock according to any preceding claim, wherein the sock has a double-walled portion containing an insert of protective material for protecting the calf, and/or ankle, and/or instep regions of a wearer.

10 25. A sock according to claim 24, wherein said protective material is a foamed plastics material.

15 26. A sock according to claim 21, 22 or 23, or to claim 24 or 25 as appendant thereto, in combination with the shin-guard.

27. A combination according to claim 26, wherein said shin-guard is extended to provide calf, and/or ankle, and/or instep protection.

20 28. A combination according to claim 27, wherein said shin-guard comprises a layer of resilient plastics material for protecting the shin and at least one of the calves, ankles and instep of a wearer, the shin-guard further comprising spaced strips of substantially rigid plastics material each running generally between the top and bottom of the shin-guard and thereby facilitate bending thereof.

30 29. A combination according to claim 28, wherein said resilient plastics material is formed with grooves extending along the

spaces between said strips, to provide hinging of the shin-guard and thereby facilitate bending thereof.

30. A combination according to claim 29, wherein said grooves have been formed by heat-pressing said resilient plastics material.

31. A combination according to any one of claims 28 to 30, wherein said resilient plastics material is a foamed plastics material.

32. A combination according to any one of claims 26 to 31, wherein the shin-guard is perforated to allow a wearer's leg to breathe.

33. A sock provided with a shin-guard contained within a double-walled portion of the sock.

34. A sock substantially as hereinbefore described with reference to Figure 1,2,3,4,5 or 6 of the accompanying drawings.

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